# PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

## NOTIFICATION OF ELECTION

(PCT Rule 61.2)

To:

Commissioner
US Department of Commerce
United States Patent and Trademark Office, PCT
2011 South Clark Place Room CP2/5C24
Arlington, VA 22202
ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

| | |
|---|---|
| **Date of mailing** (day/month/year)<br>09 July 2001 (09.07.01) | |
| **International application No.**<br>PCT/CA00/01183 | **Applicant's or agent's file reference**<br>11035-24 |
| **International filing date** (day/month/year)<br>13 October 2000 (13.10.00) | **Priority date** (day/month/year)<br>15 October 1999 (15.10.99) |
| **Applicant**<br>CONRAD, Wayne, Ernest | |

1. The designated Office is hereby notified of its election made:

[X] in the demand filed with the International Preliminary Examining Authority on:

14 May 2001 (14.05.01)

[ ] in a notice effecting later election filed with the International Bureau on:

2. The election [X] was

[ ] was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

| | |
|---|---|
| **The International Bureau of WIPO**<br>**34, chemin des Colombettes**<br>**1211 Geneva 20, Switzerland** | Authorized officer<br>Claudio Borton |
| Facsimile No.: (41-22) 740.14.35 | Telephone No.: (41-22) 338.83.38 |

I Claim:

1. A method of controlling the electrical power applied to a load, the method comprising the steps of:

(a) producing a pulse train comprising a series of pulses defining a cycle in which a portion of the pulse train having a duration of 10% of the cycle delivers more than 20% of the total power to the load which the load receives each cycle; and,

(b) supplying the pulse train to the load to supply power to the load.

2. The method as claimed in claim 1 further comprising the step of providing a first electrical signal to the load and periodically superimposing a second signal to the load whereby the load periodically receives a pulse at a higher voltage than the first electrical signal.

3. The method as claimed in claim 1 further comprising the step of providing an electric power supply and the pulse train is produced by modulating the electric power supply to produce the pulse train.

4. The method as claimed in claim 1 wherein the portion provides 30 - 70% of the total power the load receives each second.

5. The method as claimed in claim 1 wherein the portion provides 40 - 60% of the total power the load receives each second.

6. The method as claimed in claim 1 wherein the portion provides 45 - 55% of the total power the load receives each second.

7. The method as claimed in claim 1 wherein the cycle has a frequency of 6 - 20Hz.

8. The method as claimed in claim 1 wherein the cycle has a frequency of 9 - 15Hz.

9. The method as claimed in claim 1 wherein each cycle comprises 1 - 20 pulses.

10. The method as claimed in claim 1 wherein each cycle comprises 5 -15 pulses.

11. The method as claimed in claim 1 wherein the signal is non-uniform.

12. The method as claimed in claim 1 wherein the load comprises a motor and impact member assembly and the pulse train is modulated to vary the acceleration of the impact member to reduce degradation of a Prandtl layer which forms on the impact member as the fluid travels over the impact member.

13. The method as claimed in claim 1 wherein the load comprises a radiation emitting device having a radiation emitting member which emits radiation in a plurality of bands when a uniform electrical signal is provided to the radiation emitting member and the pulse train is modulated to excite electrons to selected quantum states to preferentially produce radiation in a selected spectrum.

14. The method as claimed in claim 1 wherein the load comprises a member selected from the group consisting of a fluorescent light bulb and a sodium lamp and the pulse train is modulated to excite electrons to selected quantum states to preferentially produce light.

15. The method as claimed in claim 1 wherein the load comprises a rechargeable battery in which, during the discharge of the battery, chemical reactions occur that can utilize electrons having differing potentials and during recharging, the chemical reactions are reversed and the pulse train is modulated to preferentially use electrons having a higher potential to reverse chemical reactions requiring higher potential electrons.

16. The method as claimed in claim 1 wherein the load comprises a rechargeable battery in which, during the discharge of the battery, chemical reactions occur that can utilize electrons having differing potentials and during discharging the pulse train is modulated to preferentially use higher potential electrons to provide energy to an external load.

17. A method of controlling the mechanical power applied to a load, the method comprising the steps of:

(a) producing changes in the acceleration of a mechanical member whereby a series of differing accelerations are applied in a repeating pattern to produce the mechanical power, a portion of the series having a duration of 10% of the pattern delivers more than 20% of the total power to the load which the load receives during the repetition of each period; and,

(b) supplying the mechanical power to the load to supply mechanical power to the load.

18. The method as claimed in claim 17 wherein the load comprises an impact member and the mechanical power is modulated to reduce degradation of a Prandtl layer which forms on the Prandtl layer as fluid travels over the impact member.

19. The method as claimed in claim 17 wherein the mechanical member comprises an impact member and the mechanical power is modulated to reduce degradation of a Prandtl layer which forms on the Prandtl layer as fluid travels over the impact member.

20. The method as claimed in claim 17 wherein the portion provides 30 - 70% of the total power the load receives each second.

21. The method as claimed in claim 17 wherein each period comprises 1 -20 differing accelerations.

22. The method as claimed in claim 17 wherein each period comprises 5 -20 differing accelerations.

23. The method as claimed in claim 17 wherein the rate of rotation of the impact member is varied a plurality of times during each revolution of the impact member whereby the rate of rotation of the impact member is non-uniform.

24. A method of moving a fluid using a impact member, the method comprising the steps of:

(a) providing power to rotate the impact member and form a Prandtl layer of fluid on the impact member as the impact member moves; and,

(b) varying the rate of rotation of the impact member to reduce the degradation of the Prandtl layer as the fluid travels over the impact member.

25. The method as claimed in claim 24 wherein the impact member comprises the power transfer member of a fluid pump and

the method further comprises driving the impact member to cause the fluid to flow.

26. A method of generating power from a fluid using a impact member, the method comprising the steps of:

(a) providing fluid to rotate the impact member and form a Prandtl layer of fluid on the impact member as the impact member moves, the impact member being drivingly connected to an apparatus for producing power in response to the rotation of the impact member; and,

(b) varying the rate of rotation of the impact member to reduce the degradation of the Prandtl layer as the fluid travels over the impact member.

27. The method as claimed in claim 26 wherein the apparatus comprises an electrical generator and the method further comprises driving the generator to produce electrical current.

28. The method as claimed in claim 26 wherein the apparatus comprises a drive rod and the method further comprises driving the drive rod with the impact member to obtain mechanical power.

29. A method for operating a radiation emitting device having a radiation emitting member in a plurality of bands when a uniform electrical signal is provided to the radiation emitting member, the method comprising the steps of:

(a) providing a power supply to produce a signal to excite selected quantum states within the radiation emitting member to preferentially produce radiation in a selected spectrum; and,

(b) supplying the signal to the radiation emitting device to supply power to the radiation emitting member.

30. The method as claimed in claim 29 wherein the radiation emitting member comprises an incandescent light bulb and the radiation emitting member comprises a filament and the method comprises producing a signal to preferentially produce radiation in the visible spectra.

31. The method as claimed in claim 29 wherein the radiation emitting member comprises an fluorescent light bulb and the radiation emitting member comprises gas in the fluorescent light bulb and the method comprises producing a signal to preferentially produce radiation in the visible spectra.

32. The method as claimed in claim 29 wherein the radiation emitting member comprises a sodium lamp and the radiation emitting member comprises electrodes and the method comprises producing a signal to preferentially produce radiation in the visible spectra.

33. The method as claimed in claim 29 wherein the method comprises producing a signal to preferentially produce infrared radiation.

34. The method as claimed in claim 29 wherein the method comprises producing a signal to preferentially produce x-ray radiation.

35. A method for discharging a battery comprising modulating the electron flow from the battery to preferentially use higher potential electrons to provide energy to an external load.

36. A method for charging a rechargeable battery comprising providing an electrical signal to reverse chemical reactions which occur during the discharge of the battery wherein different chemical reactions can utilize electrons having differing potentials and modulating the signal to preferentially use electrons having a higher potential to reverse chemical reactions requiring higher potential electrons.

PATENT COOPERATION TREATY

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# INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

| Applicant's or agent's file reference | FOR FURTHER ACTION | see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below. |
|---|---|---|
| 11035-24 | | |
| International application No. | International filing date *(day/month/year)* | (Earliest) Priority Date *(day/month/year)* |
| PCT/CA 00/01183 | 13/10/2000 | 15/10/1999 |
| Applicant | | |
| OMACHRON TECHNOLOGIES INC. et al. | | |

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.

[X] It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

   a. With regard to the **language,** the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

   [ ] the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

   b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

   [ ] contained in the international application in written form.

   [ ] filed together with the international application in computer readable form.

   [ ] furnished subsequently to this Authority in written form.

   [ ] furnished subsequently to this Authority in computer readble form.

   [ ] the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

   [ ] the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. [ ] **Certain claims were found unsearchable** (See Box I).

3. [X] **Unity of invention is lacking** (see Box II).

4. With regard to the **title,**

   [X] the text is approved as submitted by the applicant.

   [ ] the text has been established by this Authority to read as follows:

5. With regard to the **abstract,**

   [X] the text is approved as submitted by the applicant.

   [ ] the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No. _____

   [ ] as suggested by the applicant.

   [ ] because the applicant failed to suggest a figure.

   [ ] because this figure better characterizes the invention.

   [X] None of the figures.

# INTERNATIONAL SEARCH REPORT

International Application No
PCT/CA 00/01183

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H02P7/63 H02M3/335

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 H02P H02M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
WPI Data, PAJ, EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category ° | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| X | US 5 942 858 A (SOKOLOV VLADIMIR)<br>24 August 1999 (1999-08-24) | 1-3 |
| A | column 9, line 54 - line 59; claims 12,13;<br>figure 2 | 14 |
| | --- | |
| A | US 4 009 416 A (LOWTHER FRANK EUGENE)<br>22 February 1977 (1977-02-22)<br>abstract; figure 3 | 1-3 |
| | --- | |
| A | US 4 376 263 A (PITTROFF KURT ET AL)<br>8 March 1983 (1983-03-08)<br>abstract; figure 7 | 1,15 |
| | --- | |
| A | US 5 886 880 A (HISANAGA KOJI)<br>23 March 1999 (1999-03-23)<br>abstract; figure 1 | 1 |
| | --- | |
| | -/-- | |

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

| Date of the actual completion of the international search | Date of mailing of the international search report |
|---|---|
| 1 February 2001 | 11. 06. 01 |

| Name and mailing address of the ISA | Authorized officer |
|---|---|
| European Patent Office, P.B. 5818 Patentlaan 2<br>NL - 2280 HV Rijswijk<br>Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,<br>Fax: (+31-70) 340-3016 | BEYER, F |

Form PCT/ISA/210 (second sheet) (July 1992)

# INTERNATIONAL SEARCH REPORT

International Application No
PCT/CA 00/01183

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

| Category ° | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| A | US 4 441 147 A (SCHWARZ GERHARD E)<br>3 April 1984 (1984-04-03)<br>abstract; figure 1 | 1 |

# INTERNATIONAL SEARCH REPORT

International application No.
PCT/CA 00/01183

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-11

**Remark on Protest**

☐ The additional search fees were accompanied by the applicant's protest.

☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-11

   to deliver continuous flow of electric energy to electric loads by superimposing a pulse train to a dc basic current

2. Claims: 12,17-28

   the load comprises an impact member to regulate the flow of a fluid and the mechanical power is modulated to reduce degradation of a Prandtl layer

3. Claims: 13,14,29-34

   the load comprises radiation emitting members and the control of visible radiation by reducing the non-visible emission

4. Claims: 15,16,35,36

   the load comprises a rechargeable battery and the control of charging or discharging using an electrical signal to reverse chemical reactions

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/CA 00/01183

| Patent document cited in search report | Publication date | Patent family member(s) | Publication date |
|---|---|---|---|
| US 5942858 A | 24-08-1999 | DE 4324331 A | 26-01-1995 |
| | | WO 9503681 A | 02-02-1995 |
| | | AP 635 A | 03-04-1998 |
| | | AT 166200 T | 15-05-1998 |
| | | AU 697674 B | 15-10-1998 |
| | | AU 7531494 A | 20-02-1995 |
| | | BR 9407091 A | 03-09-1996 |
| | | CA 2167695 A | 02-02-1995 |
| | | CN 1127580 A | 24-07-1996 |
| | | DE 59405959 D | 18-06-1998 |
| | | EP 0710428 A | 08-05-1996 |
| | | ES 2121224 T | 16-11-1998 |
| | | FI 960194 A | 15-03-1996 |
| | | HK 1014233 A | 05-05-2000 |
| | | HU 74336 A | 30-12-1996 |
| | | JP 9503897 T | 15-04-1997 |
| | | PL 312661 A | 29-04-1996 |
| | | PL 174870 B | 30-09-1998 |
| | | SG 50566 A | 20-07-1998 |
| | | SI 710428 T | 31-12-1998 |
| | | ZA 9405276 A | 19-04-1996 |
| US 4009416 A | 22-02-1977 | US 4128788 A | 05-12-1978 |
| US 4376263 A | 08-03-1983 | AT 11983 T | 15-03-1985 |
| | | JP 57080238 A | 19-05-1982 |
| US 5886880 A | 23-03-1999 | JP 3038652 B | 08-05-2000 |
| | | JP 10336918 A | 18-12-1998 |
| | | AU 6907198 A | 03-12-1998 |
| | | CA 2238915 A | 28-11-1998 |
| | | FR 2764134 A | 04-12-1998 |
| US 4441147 A | 03-04-1984 | DE 3101375 A | 05-08-1982 |
| | | AT 20292 T | 15-06-1986 |
| | | DE 3271408 D | 10-07-1986 |
| | | EP 0056593 A | 28-07-1982 |
| | | JP 57139828 A | 30-08-1982 |

PATENT COOPERATION TREATY

PCT



# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

## (PCT Article 36 and Rule 70)

| Applicant's or agent's file reference | FOR FURTHER ACTION | See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416) |
|---|---|---|
| 11035-24 | | |
| International application No. | International filing date *(day/month/year)* | Priority date *(day/month/year)* |
| PCT/CA00/01183 | 13/10/2000 | 15/10/1999 |
| International Patent Classification (IPC) or national classification and IPC<br>H02P7/63 | | |
| Applicant<br>OMACHRON TECHNOLOGIES INC. et al. | | |

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 7 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 6 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the report
   - II ☐ Priority
   - III ☒ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☒ Lack of unity of invention
   - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations suporting such statement
   - VI ☐ Certain documents cited
   - VII ☐ Certain defects in the international application
   - VIII ☐ Certain observations on the international application

| Date of submission of the demand | Date of completion of this report |
|---|---|
| 14/05/2001 | 24.01.2002 |
| Name and mailing address of the international preliminary examining authority:<br>European Patent Office<br>D-80298 Munich<br>Tel. +49 89 2399 - 0 Tx: 523656 epmu d<br>Fax: +49 89 2399 - 4465 | Authorized officer<br>Kampka, A<br>Telephone No. +49 89 2399 2244 |

Form PCT/IPEA/409 (cover sheet) (January 1994)

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/CA00/01183

## I. Basis of the report

1. With regard to the **elements** of the international application *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*:
**Description, pages:**

| | |
|---|---|
| 1-37 | as originally filed |

**Claims, No.:**

| | | | | |
|---|---|---|---|---|
| 1-37 | as received on | 04/12/2001 | with letter of | 04/12/2001 |

**Drawings, sheets:**

| | |
|---|---|
| 1/17-17/17 | as originally filed |

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

   These elements were available or furnished to this Authority in the following language: , which is:

   - ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
   - ☐ the language of publication of the international application (under Rule 48.3(b)).
   - ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

   - ☐ contained in the international application in written form.
   - ☐ filed together with the international application in computer readable form.
   - ☐ furnished subsequently to this Authority in written form.
   - ☐ furnished subsequently to this Authority in computer readable form.
   - ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
   - ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

   - ☐ the description, pages:
   - ☐ the claims, Nos.:

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability**

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application.

☒ claims Nos. 13 - 37.

because:

☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (*specify*):

☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

☒ no international search report has been established for the said claims Nos. 13 - 37.

2. A meaningful international preliminary examination cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

☐ the written form has not been furnished or does not comply with the standard.

☐ the computer readable form has not been furnished or does not comply with the standard.

**IV. Lack of unity of invention**

1. In response to the invitation to restrict or pay additional fees the applicant has:

☐ restricted the claims.

☐ paid additional fees.

☐ paid additional fees under protest.

☒ neither restricted nor paid additional fees.

2. ☐ This Authority found that the requirement of unity of invention is not complied and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is

☐ complied with.

☐ not complied with for the following reasons:

4. Consequently, the following parts of the international application were the subject of international preliminary examination in establishing this report:

☐ all parts.

☒ the parts relating to claims Nos. 1 - 12.

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

| | | |
|---|---|---|
| Novelty (N) | Yes: | Claims 1 - 12 |
| | No: | Claims |
| Inventive step (IS) | Yes: | Claims 1 - 12 |
| | No: | Claims |
| Industrial applicability (IA) | Yes: | Claims 1 - 12 |
| | No: | Claims |

2. Citations and explanations
**see separate sheet**

**Re Item III**

Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

With letter dated 04.12.2001 the applicant filed a new set of claims 1 - 37, whereby claim 1 was amended and a new claim 2 was introduced. Claims 3 - 37 filed 04.12.2001, however, correspond to originally filed claims 2 - 36.

The Search Report covers claims 1 - 11 as filed and the corresponding parts of the specification. No substantive examination can be carried out for those parts of the application which are not covered by the Search Report, i.e. claims 13 - 37 filed 04.12.2001.

**Re Item IV**

Lack of unity of invention

The IPEA (International Preliminary Examination Authority) upholds the objection of lack of unity raised by the ISA (International Search Authority), see the invitation to pay additional fees dated 03.04.2001, extra sheets 1/2 - 2/2.

In order to meet the requirement of unity (Rule 13 PCT), the application should have been restricted to the first invention, i.e. claims 1 - 12 and the corresponding parts of description and drawings. Those parts of the application relating to the other inventions should have been deleted.

**Re Item V**

Reasoned statement under Art. 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following documents:

D1: US-A-5 942 858 (SOKOLOV VLADIMIR) 24 August 1999
D2: US-A-4 009 416 (LOWTHER FRANK EUGENE) 22 February 1977

D3: US-A-4 376 263 (PITTROFF KURT ET AL) 8 March 1983
D4: US-A-5 886 880 (HISANAGA KOJI) 23 March 1999
D5: US-A-4 441 147 (SCHWARZ GERHARD E) 3 April 1984

1. Document D1, which is considered to represent the closest prior art, discloses (see col. 6, line 62 - col. 7, line 42 Fig. 3, 4 and 7) a method comprising the features of claim 1 except the feature of claim 1 that the series of pulses has at least two pulses which differ in voltage and/or polarity. In D1, the pulses are of the same polarity and have constant amplitude.

2. Starting from D1 the object is to increase the energy efficiency of an electric load.

3. According to claim 1, the object is essentially solved by providing a series of non-uniform pulses. By proper selection this allows to achieve a resonance effect in the load improving the efficiency.

4. Neither of documents D2 - D5 cited in the Search Report gives any hint to apply series of pulses having at least two pulses which differ in voltage and/or polarity. Therefore, starting from D1 the invention defined in claim 1 does not appear obvious by taking into account the teaching of the other documents.

   Therefore, claim 1 meets the criteria set forth in Art. 33(1) PCT with respect to the available prior art. Claims 2 - 12 relate to preferred embodiments and therefore also meet these criteria.

5. Additional comments:

   In order to meet the requirements of Rule 5.1(a)(ii) PCT, D1 should have been cited in the description and the relevant background art disclosed therein should have been briefly discussed.

   Claim 1 should have been drafted in the two-part form, whereby the features known from D1 should be placed in the preamble (Rule 6.3(b) PCT). Alternatively, the one-part-form of claims could only be maintained, if it is clear from the discussion of D1 in the description which features of claim 1 are, in combination,

known from the prior art, see the Guidelines PCT/GL/3, III, 2.3a.

The features of preamble and characterizing part of all the claims should have been provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

The definition of the invention in the description, pages 4 - 5, bridging paragraph, should have been harmonized with amended claim 1. Different definitions of the invention in the independent claim and the description could lead to unclarity, At. 6 PCT.